

**In the Claims:**

Please cancel, without prejudice, claims 1-20 and add the following new claims:

21. (New) A method of activating a printing element within an array of printing elements on a printhead of an inkjet printer, the printhead including groups of printing elements, power switching devices, pass switching devices, and ground switching devices, and wherein the power switching devices are coupled to the printing elements, each of the  
5 pass switching devices is coupled to control the switching of a corresponding power switching device, the ground switching devices provide switched paths to ground for current flowing through the printing elements and power switching devices, and wherein, within each of the groups, subsets of printing elements and associated pass switching devices are defined, the method comprising:

- 10 (a) providing a subset selection signal to the pass switching devices and power switching devices of a selected one of the subsets;
- (b) providing an address signal to a selected subset of the pass switching devices;
- (c) providing a heater select signal to one or more of the ground switching devices;
- 15 (d) providing a primitive signal to a select one of the groups of printing elements on the printhead.

22. (New) An integrated circuit for controlling a printing operation of an inkjet printhead based on first, second, third, and fourth control signals provided by a printer controller, the printhead having a plurality of printing elements arranged in selectable groups for printing an image on a print medium and having a plurality of power switching devices,  
5 each coupled to a corresponding one of the printing elements, a plurality of pass switching devices, each coupled to a corresponding one of the power switching devices, one or more ground switching devices coupled to provide a switchable path to ground for current flowing through one or more of the power switching devices, the integrated circuit comprising:

10  $p$  number of first control lines each coupled to a corresponding one of the selectable groups of printing elements;



$q$  number of second control lines each coupled to a corresponding selectable subset of power switching devices and pass switching devices within one or more of the selectable groups of printing elements;

15         $a$  number of third control lines, each coupled to corresponding pass switching devices within each subset of printing elements; and

$h$  number of fourth control lines coupled to the one or more of the ground switching devices.

23. (New) An ink jet printer comprising:

a printer controller for generating print signals,

a printhead for generating a printed image on a print medium, the printhead including:

a plurality of printing elements arranged in selectable groups;

5        a plurality of power switching devices, each coupled to a corresponding one of the printing elements;

a plurality of pass switching devices, each coupled to a corresponding one of the power switching devices;

10        one or more ground switching devices coupled to provide a switched ground path for current flowing through one or more of the power switching devices;

$p$  number of first control lines each coupled to a corresponding one of the selectable groups of printing elements;

15         $q$  number of second control lines each coupled to a corresponding selectable subset of power switching devices and pass switching devices within one or more of the selectable groups of printing elements;

$a$  number of third control lines, each coupled to corresponding pass switching devices within each subset of printing elements; and

$h$  number of fourth control lines coupled to the one or more of the ground switching devices.

24. (New) An ink jet printer comprising:

a printer controller for generating print signals in the form of first, second, third and fourth control signals,

a printhead for generating a printed image on a print medium, the printhead including:



5           a plurality of printing elements;  
          a printhead control circuit having lines connected to each printing element to  
activate each printing element;  
          a first number of first control lines for providing the first control signals;  
          a second number of second control lines for providing the second control signals;  
10          a third number of third control lines for providing the third control signals; and  
          a fourth number of fourth control lines for providing the fourth control signals,  
wherein the printhead control circuit is in communication with the first, second, third and fourth  
control lines and a selected printing element is activated in response to the first, second, third and  
fourth control signals.

25.   (New) The ink jet printer of claim 4 wherein each print element corresponds to a unique  
combination of the first, second, third and fourth control signals, and the printhead  
control circuit is configured to activate a particular unique print element in response to  
receiving the corresponding unique combination of first, second, third and fourth control  
5       signals.

26.   (New) An ink jet printer comprising:  
        printer control means for generating print signals in the form of first, second, third and  
fourth control signals,  
        a printhead for generating a printed image on a print medium, the printhead including:  
5           a plurality of printing elements;  
          a printhead control means for controlling the activation of each of the printing  
elements;  
          a first number of first control lines for providing the first control signals;  
          a second number of second control lines for providing the second control signals;  
10          a third number of third control lines for providing the third control signals;  
          a fourth number of fourth control lines for providing the fourth control signals,  
wherein the printhead control means is responsive to the first, second, third and fourth control  
signals on the first, second, third and fourth control lines to selectively activate the printing  
elements.



27. (New) The ink jet printer of claim 6 wherein each print element corresponds to a unique combination of the first, second, third and fourth control signals, and the printhead control means is operable to activate a particular unique print element in response to the corresponding unique combination of first, second, third and fourth control signals on the first, second, third and fourth control lines.

28. (New) A method for activating a selected printing element within an array of printing elements on a printhead of an inkjet printer, wherein the printhead comprises groups of printing elements, pass switching devices, power switching devices, and common switching devices, wherein the common switching devices respectively provide switched  
5 paths between a corresponding power switching device and a common potential, and wherein at least one of the power switching devices and at least one of the common switching devices must be activated to activate the selected printing element, the method comprising:

(a) providing a pass switching device selection signal necessary to activate a pass  
10 switching device corresponding to the selected printing element;

(b) providing a power switching device selection signal necessary to activate a power  
switching device corresponding to the selected printing element;

(c) providing a group selection signal necessary to activate a group of printing  
elements that includes the selected printing element; and

15 (d) providing an activation signal necessary to activate the selected printing element.

29. (New) The method of claim 28 wherein providing the group selection signal comprises providing a primitive signal to the group of printing elements that includes the selected printing element, and wherein providing the activation signal comprises providing a common switching device selection signal necessary to activate a common switching device corresponding to the  
5 selected printing element.



30. (New) The method of claim 28 wherein providing the group selection signal comprises providing a common switching device selection signal necessary to activate the group of printing elements that includes the selected printing element, and wherein providing the activation signal comprises providing a fixed voltage to all of the printing elements on a chip of the printhead.

31. (New) The method of claim 30 wherein providing the fixed voltage selectively enables one of a plurality of chips of the printhead.

32. (New) The method of claim 28 wherein providing the pass switching device selection signal comprises providing a quadrature signal to a control circuit capable of communicating with the corresponding pass switching devices.

33. (New) The method of claim 28, wherein providing the pass switching device selection signal comprises providing an enable signal.

34. (New) The method of claim 28, wherein, responsive to the pass switching device selection signal, a pass gate transistor is activated.

35. (New) The method of claim 28, wherein, responsive to the power switching device selection signal, a power gate transistor is activated.

36. (New) An integrated circuit for controlling a printing operation of an inkjet printhead, the integrated circuit comprising:

$p$  selectable groups of printing elements;

$q$  selectable subsets of pass switching devices associated with each of one or more of the selectable groups of printing elements;

$a$  selectable subsets of power switching devices associated with each of one or more of the selectable subsets of pass switching devices; and

$h$  common switching devices associated with each of one or more of the power switching devices, wherein a respective one of the common switching devices can provide a switched path

between a corresponding one of the power switching devices and a common potential,



wherein, responsive to activation of a corresponding one of the groups, subsets of pass switching devices, subsets of power switching devices, and common switching devices, a selected printing element can be activated.

37. (New) The integrated circuit of claim 36 wherein  $p$  is equal to 16,  $q$  is equal to 4,  $a$  is equal to 5, and  $h$  is equal to 2.

38. (New) The integrated circuit of claim 37 wherein the printhead comprises 640 printing elements, 640 pass switching devices, 640 power switching devices and 640 common switching devices.

39. (New) The integrated circuit of claim 38 wherein no more than 120 of the pass switching devices and 32 of the power switching devices are active at one time.

40. (New) The integrated circuit of claim 36 wherein  $p$  is equal to 16,  $q$  is equal to 1,  $a$  is equal to 10, and  $h$  is equal to 4.

41. (New) The integrated circuit of claim 36 wherein  $p$  is equal to 1,  $q$  is equal to 4,  $a$  is equal to 10, and  $h$  is equal to 16.

42. (New) The integrated circuit of claim 36 wherein, in correspondence to a printing element being active, only one of the groups is active, only one of the subsets of pass switching devices is active, only one of the power switching devices in each of the active subsets is active, and only one of the pass switching devices associated with the active power switching devices is active.

43. (New) The integrated circuit of claim 36 further comprising  $[q-1]$  pulldown devices associated with each pass switching device.

44. (New) The integrated circuit of claim 36 further comprising a control circuit, wherein the pass switching devices are responsive to the control circuit.



45. (New) The integrated circuit of claim 36 wherein the common switching devices comprise ground switching devices.
46. (New) The integrated circuit of claim 36 wherein the pass switching devices and the power switching devices are separate devices.